

WHAT IS CLAIMED IS:

1. A fuel cell system comprising a fuel cell that generates electric power through electrochemical reactions of oxygen included in an oxidizing gas, which passes through an oxidizing gas conduit provided on a cathode side of an electrolyte membrane in a wet state, and hydrogen included in a gaseous fuel, which passes through a gaseous fuel conduit provided on an anode side of the electrolyte membrane in the wet state, said fuel cell system further comprising:

an outer-conduit water absorbing member that is disposed outside said oxidizing gas conduit and is capable of absorbing moisture; and

a changeover module that changes over status of said outer-conduit water absorbing member between an absorption state of absorbing moisture in said oxidizing gas conduit and a non-absorption state of not absorbing the moisture in said oxidizing gas conduit.

2. A fuel cell system in accordance with claim 1, wherein said changeover module changes over the status of said outer-conduit water absorbing member between the absorption state, which brings said outer-conduit water absorbing member into contact with an outlet of said oxidizing gas conduit to make said outer-conduit water absorbing member absorb the

moisture in said oxidizing gas conduit, and the non-absorption state, which separates said outer-conduit water absorbing member from the outlet of said oxidizing gas conduit to prevent said outer-conduit water absorbing member from absorbing the
5 moisture in said oxidizing gas conduit.

3. A fuel cell system in accordance with claim 1, said fuel cell system further comprising:

a changeover control module that controls said changeover module according to an operating state of said fuel
10 cell.

4. A fuel cell system in accordance with claim 3, said fuel cell system further comprising:

an operating state detection module that detects the operating state of said fuel cell,

15 wherein said changeover control module controls said changeover module to bring said outer-conduit water absorbing member into contact with the outlet of said oxidizing gas conduit when said operating state detection module detects an excess level of the moisture in said oxidizing gas conduit,
20 while controlling said changeover module to separate said outer-conduit water absorbing member from the outlet of said oxidizing gas conduit when said operating state detection module detects a relatively low level of the moisture in said

oxidizing gas conduit.

5. A fuel cell system in accordance with claim 3, said fuel cell system further comprising:

an operating state detection module that detects the
5 operating state of said fuel cell,

wherein said changeover control module controls said changeover module to bring said outer-conduit water absorbing member into contact with the outlet of said oxidizing gas conduit when said operating state detection module detects a
10 high output level of said fuel cell, while controlling said changeover module to separate said outer-conduit water absorbing member from the outlet of said oxidizing gas conduit when said operating state detection module detects a relatively low output level of said fuel cell.

15 6. A fuel cell system in accordance with claim 1, wherein said changeover module regulates an effective contact area of said outer-conduit water absorbing member with the outlet of said oxidizing gas conduit.

7. A fuel cell system in accordance with claim 1, said
20 fuel cell system further comprising:

an inner-conduit water holding member that is disposed at least on a side of an outlet of said oxidizing gas conduit to absorb the moisture in said oxidizing gas conduit,

wherein said outer-conduit water absorbing member comes into contact with the outlet of said oxidizing gas conduit and thereby with said inner-conduit water holding member, so as to absorb the moisture in said oxidizing gas conduit via said inner-conduit water holding member.

8. A fuel cell system in accordance with claim 7, wherein said inner-conduit water holding member absorbs the moisture by taking advantage of capillary phenomenon.

9. A fuel cell system in accordance with claim 1, wherein said outer-conduit water absorbing member absorbs the moisture by taking advantage of capillary phenomenon.

10. A fuel cell system in accordance with claim 1, said fuel cell system further comprising:

a fuel cell stack comprising a plurality of said fuel cells laying one upon another; and

an oxidizing gas exhaust manifold that joins respective outlets of oxidizing gas conduits formed in said plurality of fuel cells,

wherein said outer-conduit water absorbing member is located in said oxidizing gas exhaust manifold.

11. A fuel cell system in accordance with claim 4, said fuel cell system further comprising:

an inner-conduit water holding member that is disposed

at least on a side of an outlet of said oxidizing gas conduit
to absorb the moisture in said oxidizing gas conduit,

wherein said outer-conduit water absorbing member comes
into contact with the outlet of said oxidizing gas conduit and
5 thereby with said inner-conduit water holding member, so as
to absorb the moisture in said oxidizing gas conduit via said
inner-conduit water holding member.

12. A fuel cell system in accordance with claim 11,
wherein said inner-conduit water holding member and said
10 outer-conduit water absorbing member absorb the moisture by
taking advantage of capillary phenomenon.

13. A fuel cell system in accordance with claim 5, said
fuel cell system further comprising:

an inner-conduit water holding member that is disposed
15 at least on a side of an outlet of said oxidizing gas conduit
to absorb the moisture in said oxidizing gas conduit,

wherein said outer-conduit water absorbing member comes
into contact with the outlet of said oxidizing gas conduit and
thereby with said inner-conduit water holding member, so as
20 to absorb the moisture in said oxidizing gas conduit via said
inner-conduit water holding member.

14. A fuel cell system in accordance with claim 13,
wherein said inner-conduit water holding member and said

outer-conduit water absorbing member absorb the moisture by taking advantage of capillary phenomenon.

15. A fuel cell system comprising a fuel cell that generates electric power through electrochemical reactions of
5 an oxidizing gas and a gaseous fuel, which passes through respective gas conduits, said fuel cell system further comprising:

an outer-conduit water absorbing member that is disposed outside at least one of said gas conduits, and is capable of
10 absorbing moisture; and

a changeover module that changes over status of said outer-conduit water absorbing member between an absorption state of absorbing moisture and a non-absorption state of not absorbing moisture in said at least one gas conduit.

15 16. A vehicle with a fuel cell system mounted thereon, said fuel cell system comprising a fuel cell that generates electric power through electrochemical reactions of oxygen included in an oxidizing gas, which passes through an oxidizing gas conduit provided on a cathode side of an electrolyte
20 membrane in a wet state, and hydrogen included in a gaseous fuel, which passes through a gaseous fuel conduit provided on an anode side of the electrolyte membrane in the wet state,

said fuel cell system further comprising:

an outer-conduit water absorbing member that is disposed outside said oxidizing gas conduit, and is capable of absorbing moisture; and

a changeover module that changes over status of said
5 outer-conduit water absorbing member between an absorption state of absorbing moisture in said oxidizing gas conduit and a non-absorption state of not absorbing the moisture in said oxidizing gas conduit.

17. A vehicle with a fuel cell system mounted thereon in
10 accordance with claim 16, said fuel cell system further comprising:

a changeover control module that controls said changeover module according to an operating state of said fuel cell.

15 18. A vehicle with a fuel cell system mounted thereon in accordance with claim 17, said fuel cell system further comprising:

an operating state detection module that detects the operating state of said fuel cell,

20 wherein said changeover control module controls said changeover module to bring said outer-conduit water absorbing member into contact with the outlet of said oxidizing gas conduit when said operating state detection module detects an

excess level of the moisture in said oxidizing gas conduit,
while controlling said changeover module to separate said
outer-conduit water absorbing member from the outlet of said
oxidizing gas conduit when said operating state detection
5 module detects a relatively low level of the moisture in said
oxidizing gas conduit.

19. A vehicle with a fuel cell system mounted thereon
in accordance with claim 17, said fuel cell system further
comprising:

10 an operating state detection module that detects the
operating state of said fuel cell,

wherein said changeover control module controls said
changeover module to bring said outer-conduit water absorbing
member into contact with the outlet of said oxidizing gas
15 conduit when said operating state detection module detects a
high output level of said fuel cell, while controlling said
changeover module to separate said outer-conduit water
absorbing member from the outlet of said oxidizing gas conduit
when said operating state detection module detects a relatively
20 low output level of said fuel cell.

20. A vehicle with a fuel cell system mounted thereon
in accordance with claim 16, said fuel cell system further
comprising:

an inner-conduit water holding member that is disposed at least on a side of an outlet of said oxidizing gas conduit to absorb the moisture in said oxidizing gas conduit,

wherein said outer-conduit water absorbing member comes
5 into contact with the outlet of said oxidizing gas conduit and thereby with said inner-conduit water holding member, so as to absorb the moisture in said oxidizing gas conduit via said inner-conduit water holding member.

21. A vehicle with a fuel cell system mounted thereon,
10 said fuel cell system comprising a fuel cell that generates electric power through electrochemical reactions of an oxidizing gas and a gaseous fuel, which passes through respective gas conduits,

said fuel cell system further comprising:

15 an outer-conduit water absorbing member that is disposed outside at least one of said gas conduits, and is capable of absorbing moisture; and

a changeover module that changes over status of said outer-conduit water absorbing member between an absorption
20 state of absorbing moisture and a non-absorption state of not absorbing moisture in said at least one gas conduit.